

I CLAIM AS MY INVENTION:

1. A magnetic resonance device, comprising:
 - a basic field magnet to generate a basic magnetic field that exhibits, within an imaging volume of the magnetic resonance device, a main component optimally and exclusively oriented in a predeterminable direction;
 - at least one gradient coil arranged in a region of a gradient magnetic field in which the basic magnetic field exhibits at least one secondary component perpendicular to the main component; and
 - conductors of the gradient coil arranged such that, given flow of an electrical current in the conductors, a turning moment operating via the main component and affecting a part of the gradient coil is at least partially compensated by a turning moment acting via the secondary component.
2. The magnetic resonance device according to claim 1 wherein the main component and the secondary component exhibit a comparable magnitude in the region of the conductors.
3. The magnetic resonance device according to claim 1 wherein the conductors are arranged in a substantially hollow cylindrical region.
4. The magnetic resonance device according to claim 3 wherein the main component is oriented in a direction of a hollow-cylinder main axis of the hollow-cylindrical region.

5. The magnetic resonance device according to claim 3 wherein the gradient coil is partitioned into two sub-coils in an axial direction of the hollow-cylindrical region.

6. The magnetic resonance device according to claim 5 wherein a spatial curve of the secondary component in the axial direction in a region of the conductor of one of the sub-coils exhibits a change of sign.

7. The magnetic resonance device according to claim 5 wherein at least one of the sub-coils is designed with regard to its focal point to compensate turning moments.

8. The magnetic resonance device according to claim 5 wherein the conductors of at least one of the sub-coils are arranged such that, given flow of the electrical current in the conductors, forces operating on the conductors perpendicular to the axial direction at least partially counter each other.

9. The magnetic resonance device according to claim 3 wherein the gradient coil comprises a transversal gradient coil.

10. The magnetic resonance device according to claim 1 wherein the gradient coil comprises an actively shielded gradient coil.

11. The magnetic resonance device according to claim 10 wherein the actively shielded gradient coil comprises a primary coil and a shielding coil.

12. A magnetic resonance device, comprising:
a basic field magnet to generate a basic magnetic field that exhibits, within an imaging volume of the magnetic resonance device, a main component oriented in a predetermined direction;

at least one gradient coil arranged in a region of a gradient magnetic field in which the basic magnetic field exhibits at least one secondary component perpendicular to the main component; and

conductors of the gradient coil arranged such that, given flow of an electrical current in the conductors, a turning moment operating via the main component and affecting at least a part of the gradient coil is at least partially compensated by a turning moment acting via the secondary component.

13. A method for compensating for a turning moment effecting at least a part of a gradient coil in a magnetic resonance device, comprising the steps of:

providing in the magnetic resonance device a basic magnetic field magnet which generates a basic magnetic field that exhibits, within an imaging volume of the magnetic resonance device, a main component oriented in a predetermined direction;

arranging the gradient coil in a region of a gradient magnetic field in which the basic magnetic field exhibits at least one secondary component perpendicular to the main component; and

arranging conductors of the gradient coil such that, given flow of an electrical current in the conductors, the turning moment caused by the main component and which effects a part of the gradient coil is at least partially compensated by a turning moment acting via the secondary component.